



Western Europe

a data analysis using python

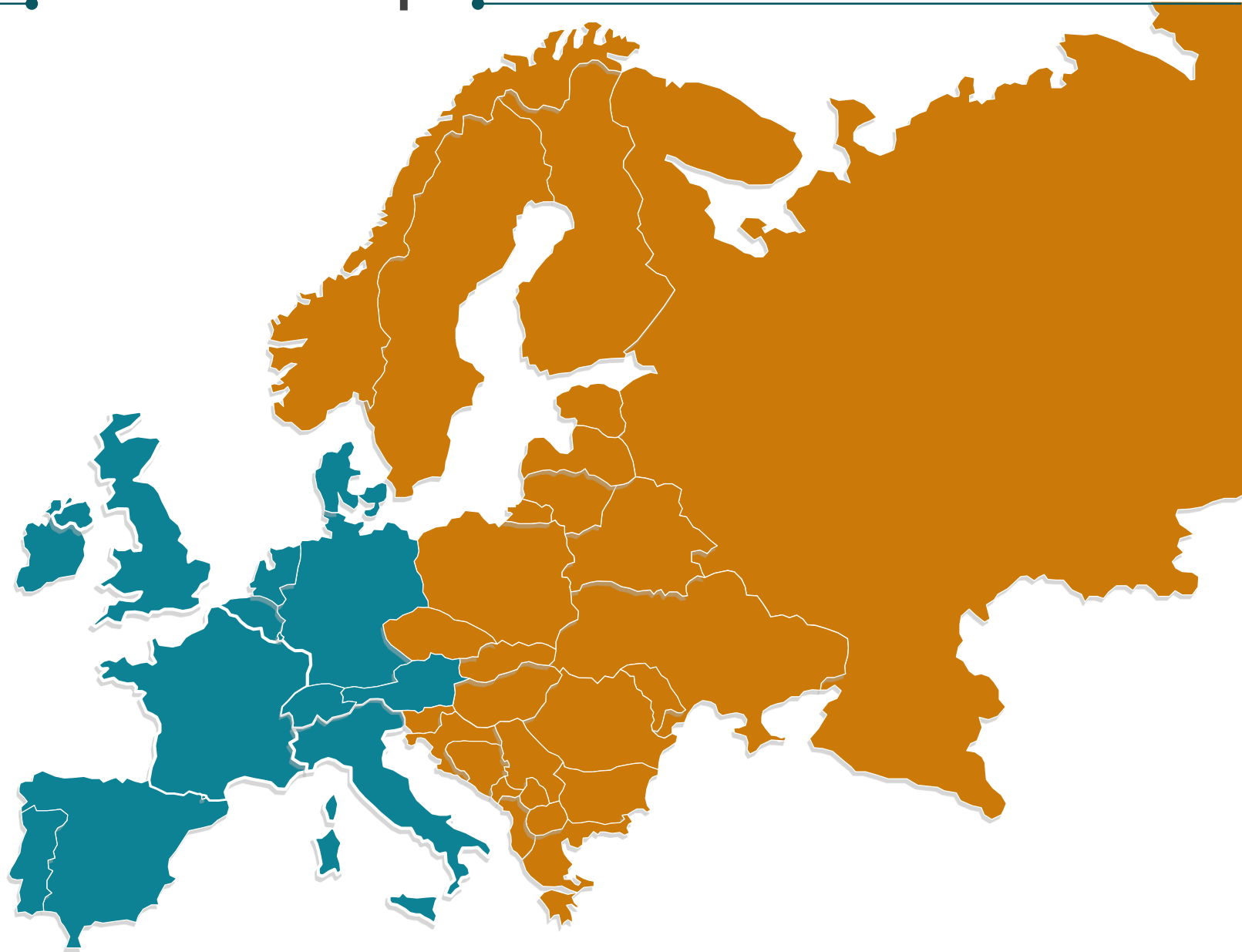
Team 4

Western Europe.

Greenland



St Martin & Sint Maarten

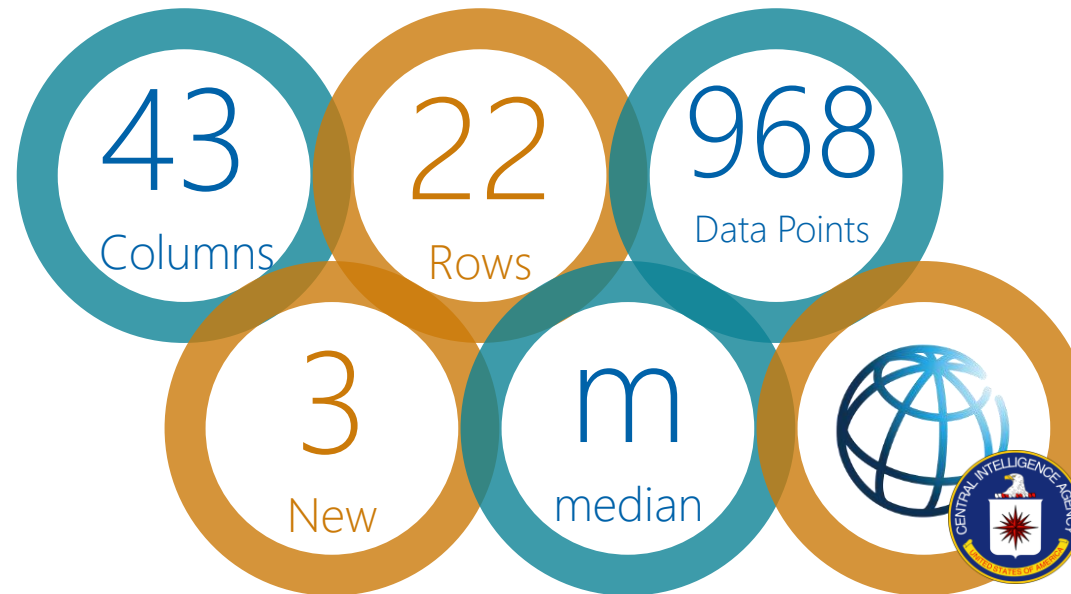


Preliminary Data Set Analysis

Columns featuring economic, geographic, sociographic, educational and military data

Selection of 22 Western European countries by geophysical body, not governmental body

Small data set allowing for manual analysis rather than standardized automatic analysis (ML)

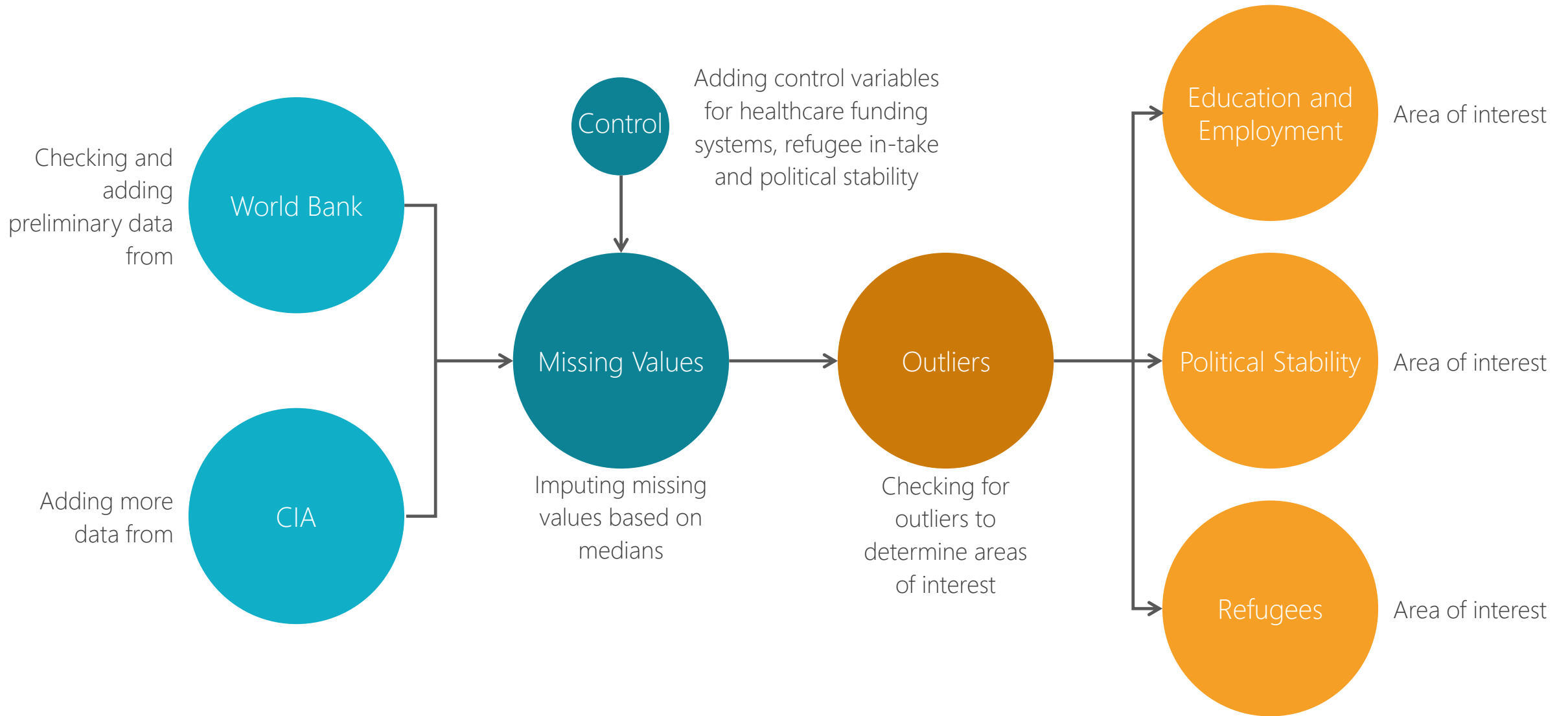


Introduced data points on healthcare funding systems, refugee in-take and political stability

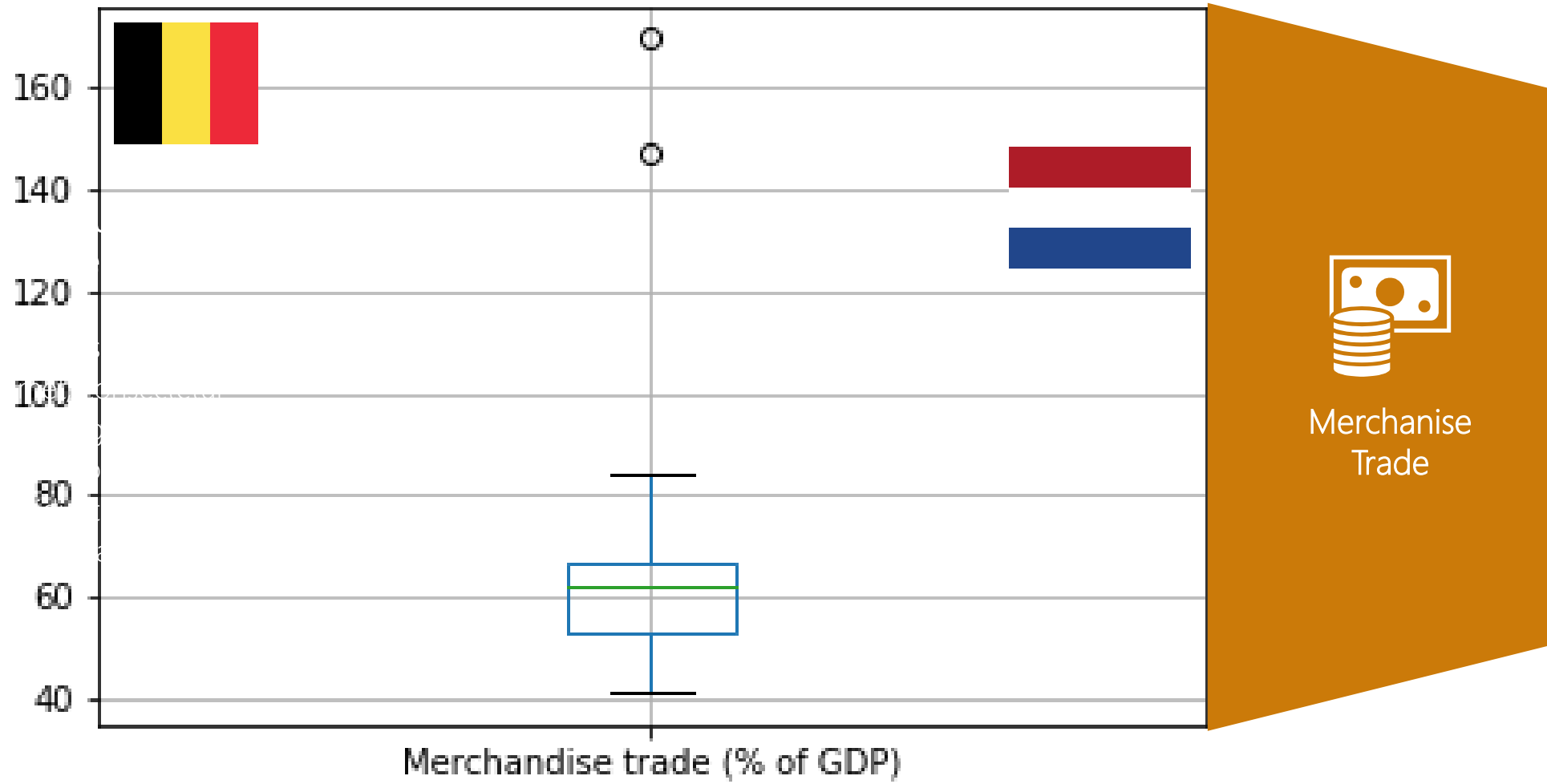
Analyzing data distribution showed non-normality for data set, therefore medians were used to impute missing values

Main data source is the World Bank group, with military related data sourced from the CIA

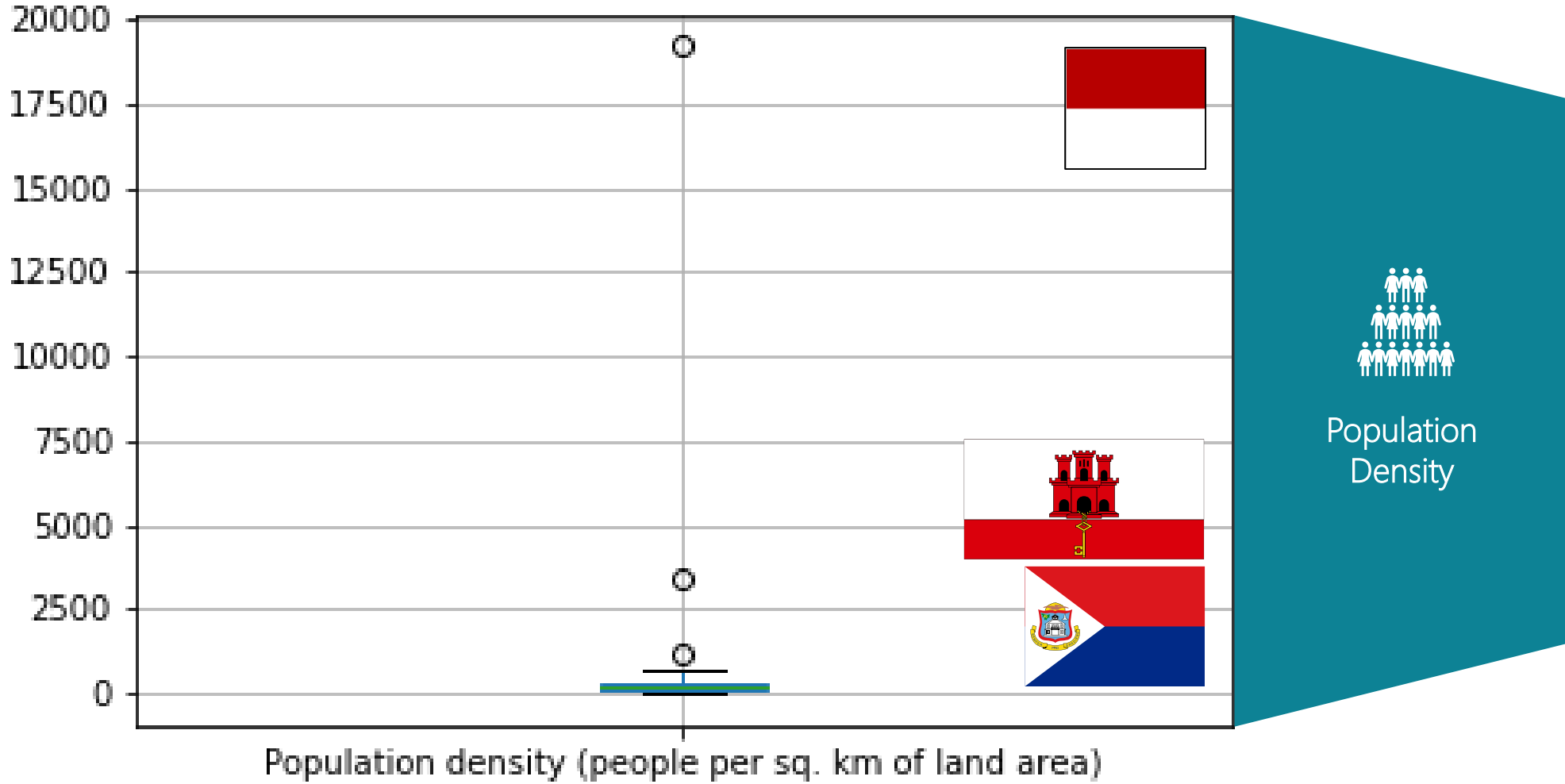
Analysis Approach



Noticeable Data



Noticeable Data

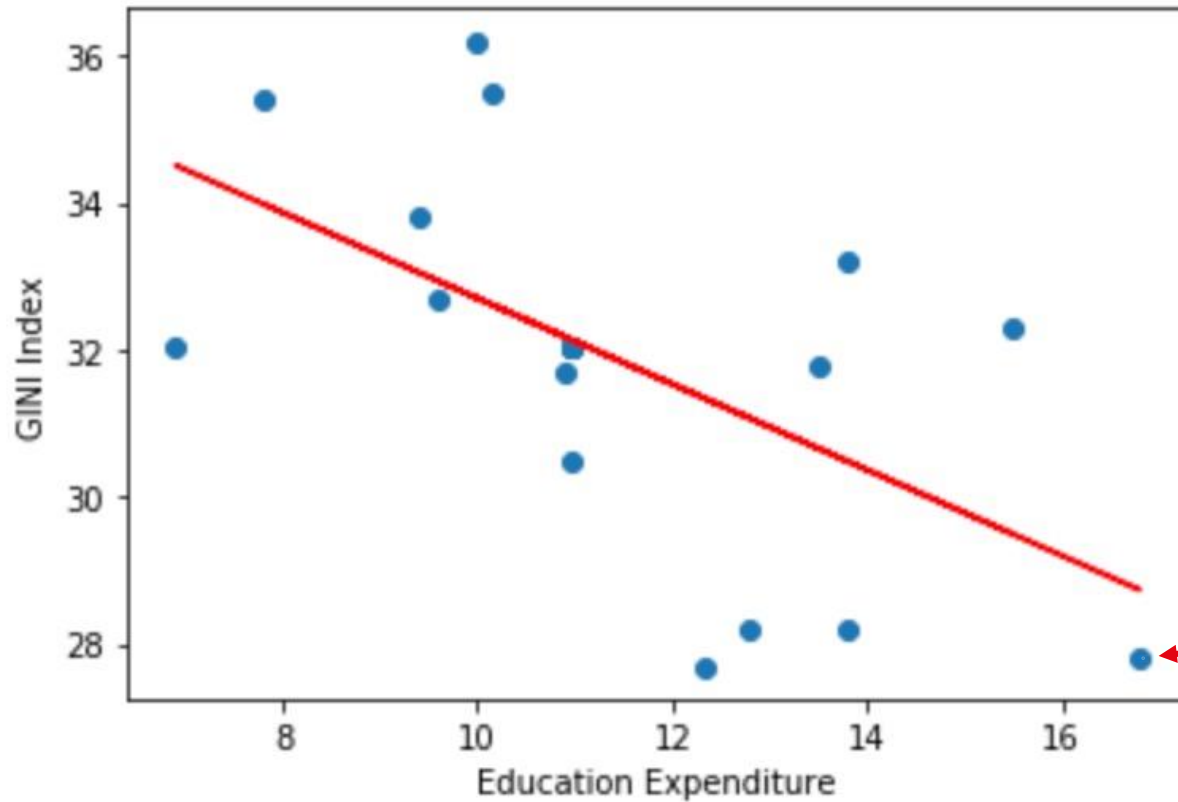


Education Helps Equality

“Progressive spending on schooling has a direct impact on the income distribution” – World Bank, 2012

<https://www.globalpartnership.org/blog/education-and-income-inequality-importance-basic-education>

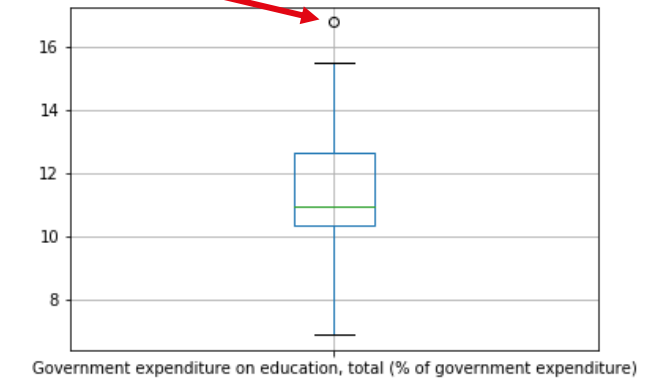
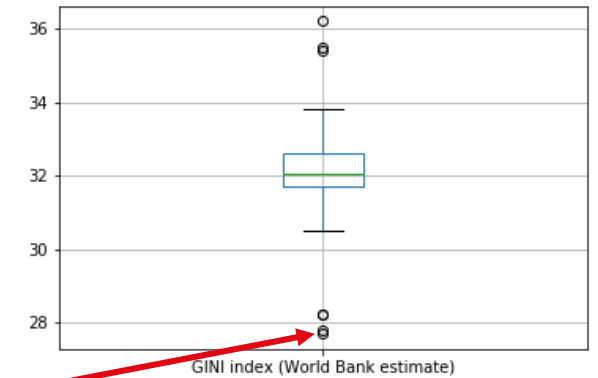
Effects of Education.



Correlation -0.57

The higher the government expenditure

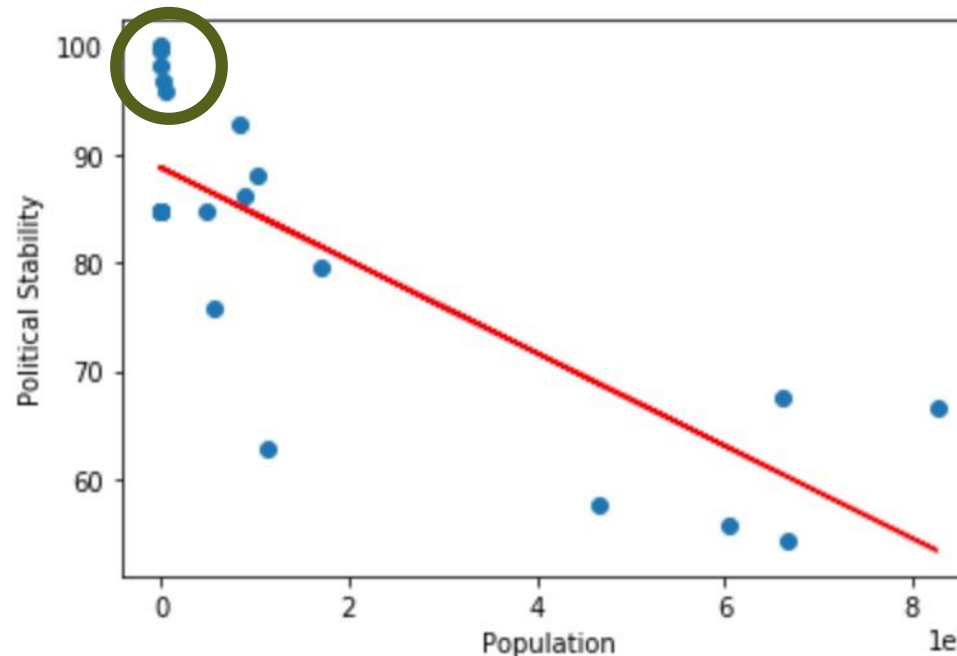
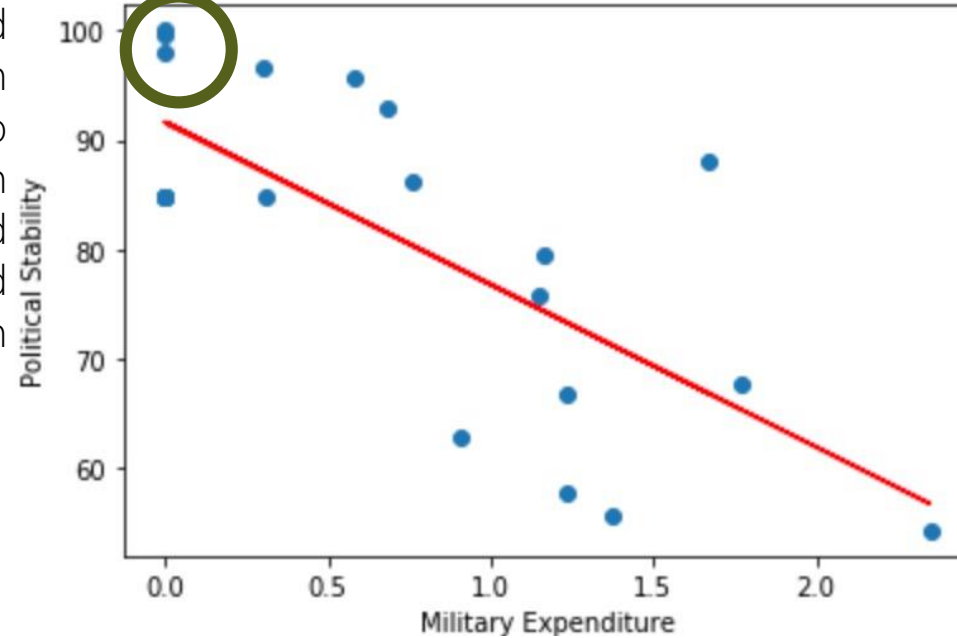
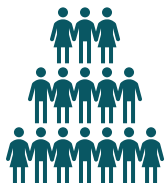
The lower the GINI index



Population Size Increases
Political Instability

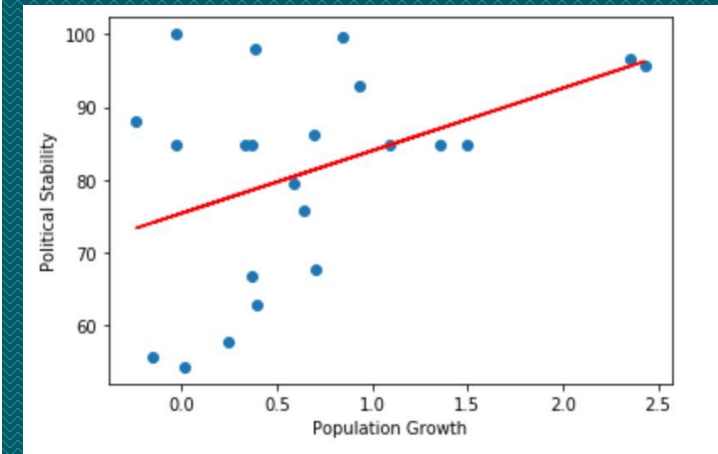
Political Stability

Greenland
Liechtenstein
Monaco
St Martin/Sint Maarten
Faroe Island
Iceland
Isle of Man



Qualitative Research
(Journal of Population Economics)
states that **growth NOT size** is
contributing.

Our analysis shows **growth to
counteract**



Dependend on
- Developing status?

https://www.jstor.org/stable/20008019?seq=1#page_scan_tab_contents

Europe's Post-Industrial Jobs Affect People's Movement

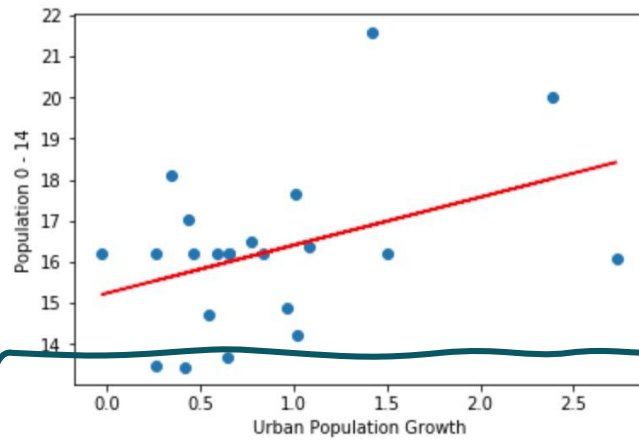
**“The twin attractions of big cities – mass industrialisation and easy access to jobs – have taken their toll on rural existence.” –
Alina Trabattoni, 2016**

<https://theconversation.com/who-will-breathe-life-back-into-europes-dying-villages-58942>

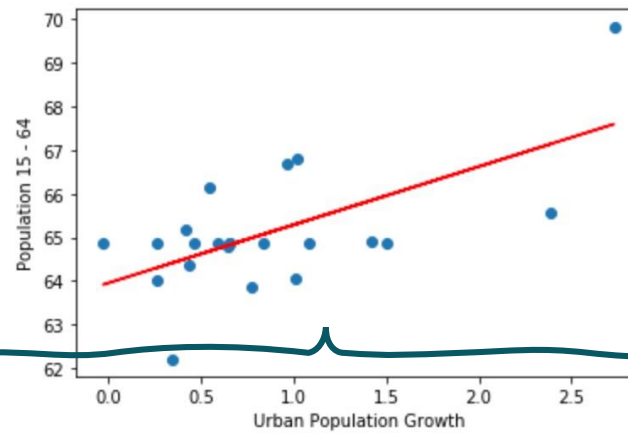
The Story of Life.



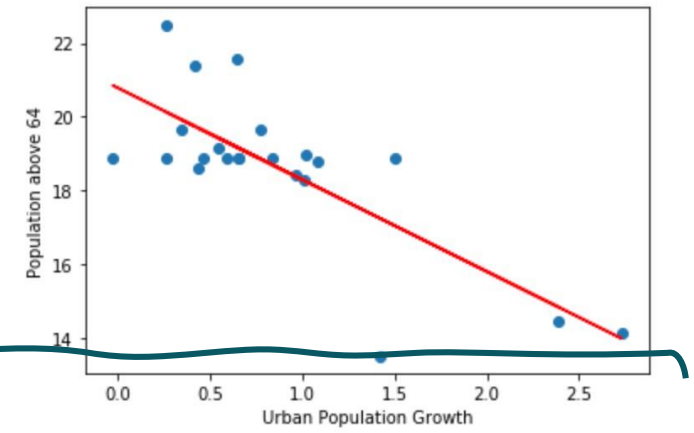
0-14 years



15-64 years



65+ years



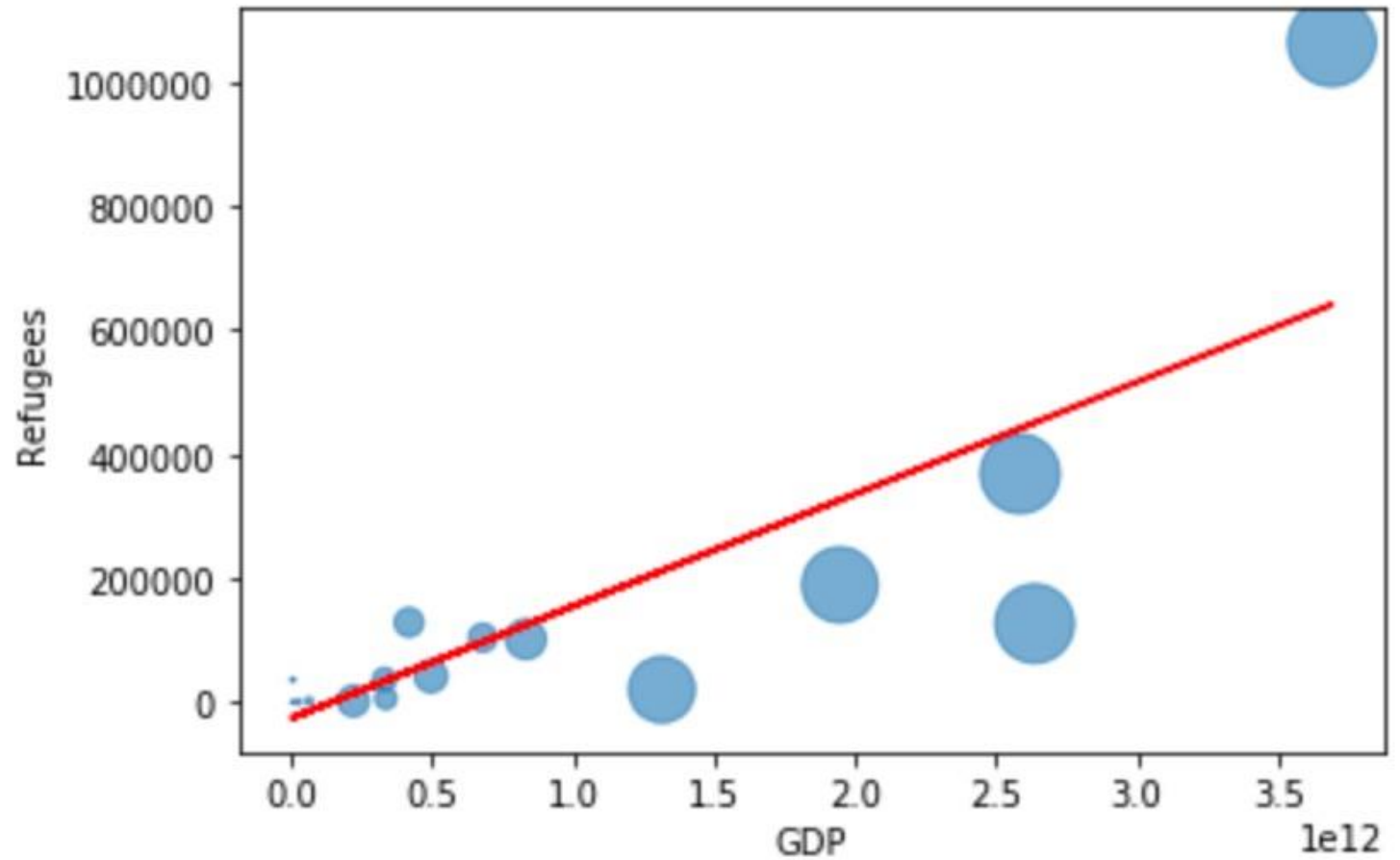
Wealthy Countries Attract Refugees

“A functioning European distribution system for refugees does not exist.” – Intereconomics, 2016

<https://archive.intereconomics.eu/year/2016/4/on-the-distribution-of-refugees-in-the-eu/>

Uncoordinated Distribution of Refugees

Population Size



Proposed Distribution

per capita



per GDP



per integration cost



Correlation \neq Causation

The smaller the country size, the bigger the growth

(Italy and Portugal have shrinking populations)
(Luxembourg has a growing population)

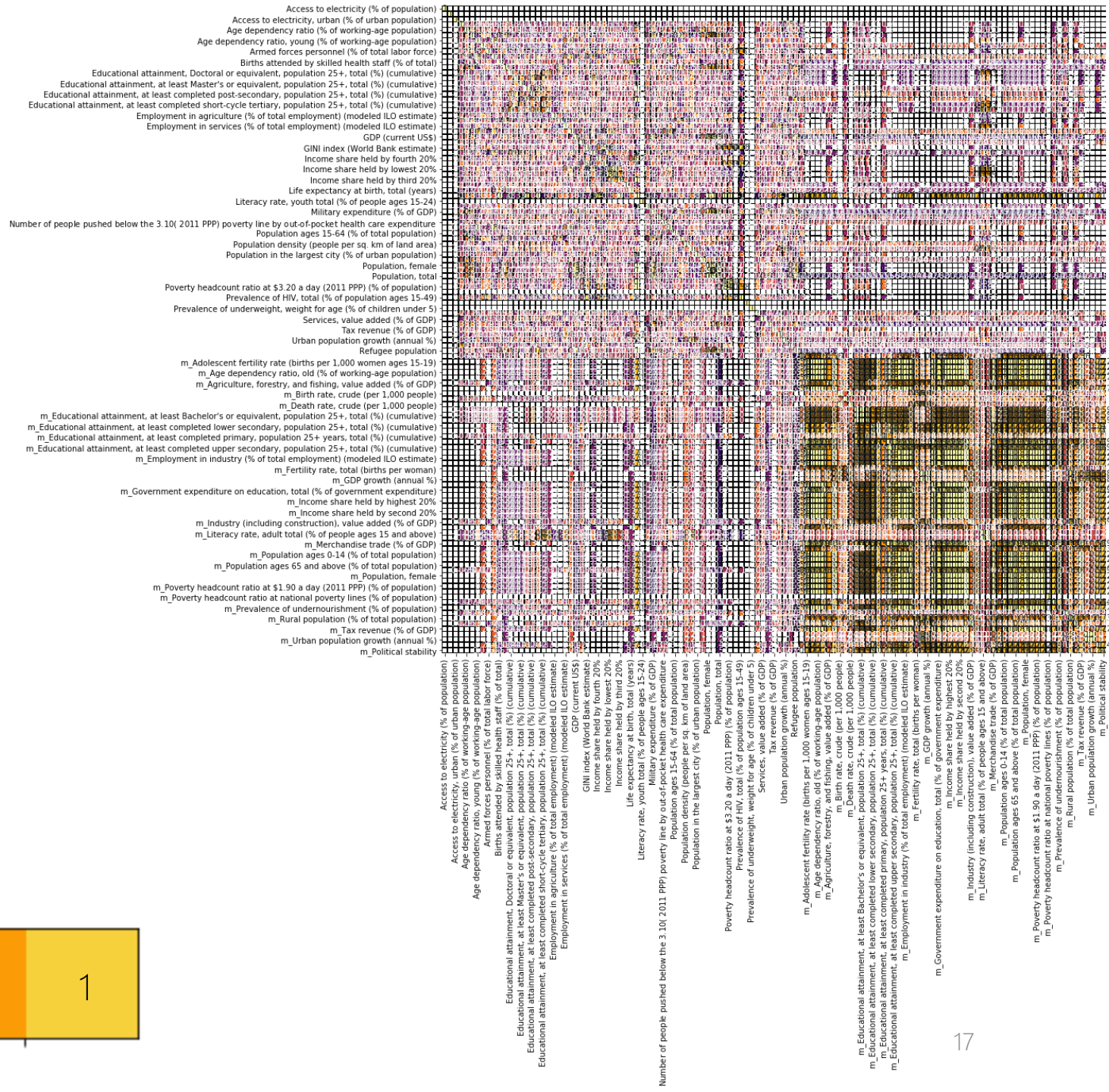
The closer people live together, the less mobile phones

(Italy, a high density country, has a very low mobile phone coverage due to old population)



Thank You

Original heatmap with missing values



dropping



	Adolescent fertility rate (births per 1,000 women ages 15-19)	1.029112	0.060309	0.045231	220.180	36.066110	110.390	140.160	340.390	390.250	120.240	220.240	110.380	0.050321	30.140	120.222	0.027070	30.380	0.066208	50.04400
	Age dependency ratio (% of working-age population)	0.72	1.149	1.61	110.250	0.78	1.10	1.20	0.81	1.30	2.0	0.84	0.029	2.0	3.0	2.4	0.1	0.3	0.05	0.70
	Age dependency ratio, old (% of working-age population)	0.13	0.45	1.03	0.46	0.40	0.48	0.53	0.30	0.30	0.10	0.08	0.04	0.07	0.07	0.04	0.07	0.04	0.07	0.04
	Age dependency ratio, young (% of working-age population)	0.66	1.60	3.8	1.0	2.0	2.7	0.80	5.0	1.0	4.7	3.3	0.60	1.8	2.0	3.0	0.30	0.30	0.30	0.30
	Agriculture, forestry, and fishing, value added (% of GDP)	0.039	1.81	0.40	1.0	0.2	0.040	0.4	0.10	0.40	0.6	0.1	0.04	0.03	0.1	0.04	0.03	0.1	0.04	0.03
	Armed forces personnel (% of total labor force)	0.06	0.25	0.40	270.28	1.0	0.30	0.30	0.9	1.0	1.0	30.070	0.28	0.30	0.4	0.20	0.41	1.4	1.4	0.4
	Birth rate, crude (per 1,000 people)	0.045078	0.48	0.81	0.84	3	1.0	0.30	1.0	0.39	0.70	0.28	0.30	0.50	0.30	0.28	0.70	0.28	0.30	0.50
	Death rate, crude (per 1,000 people)	0.23	0.18	0.50	0.03	0.34	0.38	1.06	0.30	0.30	0.30	0.10	0.20	0.03	0.10	0.03	0.03	0.10	0.03	0.10
	Employment in agriculture (% of total employment) (modeled ILO estimate)	0.220	1.0	0.038	12.0	0.098	1.08	1.0	0.140	0.48	0.28	0.43	0.27	0.080	0.6	0.30	0.44	0.28	0.43	0.27
	Employment in industry (% of total employment) (modeled ILO estimate)	0.18	0.05	0.40	0.40	1.0	0.05	0.1	0.6	0.2	0.10	0.066	0.2	0.10	0.20	0.080	0.44	0.09	0.14	0.20
	Employment in services (% of total employment) (modeled ILO estimate)	0.38	0.010	0.30	0.60	0.44	1.0	0.30	0.40	0.6	1.0	1.320	1.0	0.98	1.8	2.40	1.0	2.40	2.5	0.44
	Fertility rate, total (births per woman)	0.069	0.390	1.0	0.60	0.60	0.70	0.30	2.0	1.0	0.32	1.0	0.20	1.0	0.40	0.50	0.30	0.50	0.40	0.60
	GDP (current US\$)	0.110	250.360	150.100	0.070	2.90	390.250	270.120	2.2	1.0	0.68	1.0	0.018	0.018	0.070	2.80	0.018	0.018	0.070	2.80
	GDP growth (annual %)	0.18	0.020	0.090	0.230	2.20	2.50	2.8	0.32	0.44	1.0	0.09	1.0	0.1	0.1	0.290	0.40	1.270	1.0	0.290
	GINI index (World Bank estimate)	0.32	0.04	1.00	0.30	1.0	0.30	0.14	0.27	0.68	1.80	0.40	1.0	1.0	0.4	0.30	0.50	0.80	0.20	0.68
	Government expenditure on education, total (% of government expenditure)	0.14	0.020	0.35	0.390	0.70	0.64	0.50	0.28	0.88	0.74	0.40	0.18	0.20	0.40	0.10	0.05	0.10	0.05	0.10
	Income share held by fourth 20%	0.180	0.26	0.56	0.340	1.8	0.40	1.8	0.56	1.20	1.0	0.58	1.0	0.30	0.30	0.30	1.0	0.20	0.56	0.340
	Income share held by highest 20%	0.36	0.110	0.190	0.280	1.30	0.390	0.28	1.0	1.0	0.30	1.0	0.20	0.30	0.30	0.30	1.0	0.20	0.30	0.30
	Income share held by lowest 20%	0.35	1.10	1.8	0.															
	Income share held by second 20%	0.33	1.8	0.89	0.250	1.4	2.9	0.79	0.34	0.89	2.48	0.89	1.0	0.20	0.30	0.89	1.0	0.20	0.30	0.89
	Income share held by third 20%	0.26	0.029	0.09	0.050	0.20	0.090	0.030	0.045	0.02300	0.068	1.0	0.20	0.632	0	0.68	0.45	0.51	1.0	0.68
	Industry (including construction), value added (% of GDP)	0.130	0.24	0.74	0.638	4.0	0.033	0.260	4.0	1.80	2.0	0.0631	0	0.090	0.060	0.61	1.0	0.089	0.26	0.61
	Life expectancy at birth, total (years)	0.74	0.30	2.0	0.010	2.0	1.40	1.0	1.2	0.8	0.90	1.8	0.39	1.6	1.0	1.2	0.30	0.30	0.8	1.6
	Merchandise trade (% of GDP)	0.270	0.28	0.070	0.99	2.50	1.4	1.8	0.4	0.38	1.4	0.38	1.0	0.480	0.6	3.8	1.0	0.56	3.0	0.270
	Military expenditure (% of GDP)	0.22	0.47	0.65	0.28	0.79	0.30	0.48	0.70	0.20	0.20	0.70	0.055	0.20	1.0	0.055	0.20	1.0	0.055	0.20
	Mobile cellular subscriptions (per 100 people)	0.110	0.20	0.070	0.430	2.0	1.0	1.0	0.030	1.0	0.10	0.030	1.0	0.048	1.0	0.050	0.048	1.0	0.048	1.0
	Number of people pushed below the 3.10% (2011 PPP) poverty line by out-of-pocket health care expenditure	0.33	0.25	0.070	0.290	0.030	0.240	0.030	0.050	0.150	0.190	0.088	0.30	1.0	0.30	0.26	0.20	0.20	0.30	0.095
	Population ages 0-14 (% of total population)	0.66	1.60	3.8	1.0	2.0	2.7	0.80	5.0	1.0	4.7	3.3	0.60	1.8	2.0	3.0	0.30	0.30	0.30	0.30
	Population ages 15-64 (% of total population)	0.22	1.0	0.40	1.60	1.8	0.28	0.78	1.8	1.2	0.0510	1.30	0.28	0.03	0.40	0.28	0.10	0.28	0.03	0.40
	Population ages 65 and above (% of total population)	0.13	0.32	0.870	0.52	0.490	0.70	0.60	1.2	0.50	0.450	0.30	0.27	0.09	0.20	0.44	0.18	0.20	0.44	0.30
	Population density (people per sq. km of land area)	0.240	0.059	1.20	1.20	0.098	1.8	0.78	0.58	0.110	0.30	0.88	1.10	0.30	1.8	1.9	1.0	1.7	0.1	0.028
	Population growth (annual %)	0.180	0.30	0.780	0.340	0.50	0.58	0.240	0.50	1.0	0.47	0.49	1.10	0.80	1.0	0.220	0.038	0.28	0.09	1.10
	Population, female	0.29	0.34	0.50	0.270	1.80	0.250	0.34	0.570	1.8	0.360	0.240	0.078	0.30	0.78	1.50	0.30	1.80	0.28	0.68
	Population, male	0.220	0.32	0.55	0.30	1.50	0.230	0.340	0.60	1.8	0.30	1.90	1.089	0.09	1.80	2.10	1.40	2.10	1.4	0.74
	Population, total	0.20	0.34	0.50	0.28	0.030	0.250	0.34	0.570	1.8	0.360	0.240	0.078	0.30	0.78	1.50	0.30	1.80	0.28	0.68
	Rural population (% of total population)	0.270	1.0	1.6	0.30	1.8	0.050	0.58	1.0	0.470	0.430	0.58	0.46	0.098	0.230	0.30	0.080	0.56	0.30	0.230
	Services, value added (% of GDP)	0.32	0.0	0.29	0.210	0.49	1.50	1.50	1.0	0.30	0.38	0.40	0.28	0.074	0.30	0.69	1.8	1.8	0.074	0.30
	Surface area (sq. km)	0.330	0.230	0.380	1.20	0.30	0.090	1.9350	1.6	0.340	0.30	0.740	0.059	0.20	0.770	0.030	0.20	0.30	1.4	0.16
	Tax revenue (% of GDP)	0.066	0.230	1.4	0.230	0.009	0.240	1.50	2.0	0.30	0.380	0.240	0.089	1.50	0.04	1.80	0.160	1.60	1.40	0.160
	Urban population (% of total population)	0.280	1.0	1.60	0.30	1.8	0.050	0.70	1.0	0.240	0.430	0.58	0.46	0.098	0.230	0.30	0.080	0.56	0.30	0.230
	Urban population growth (annual %)	0.089	0.40	0.650	0.30	0.40	0.49	0.460	1.0	0.68	0.40	0.20	1.8	0.260	0.240	0.380	1.8	0.270	1.8	0.260
	Type of healthcare system	3.50	0.090	0.09	0.17	0	0.18	1.0	0.40	0.0	0.27	1.8	0.020	0.08	0.09	1.50	0.40	0.32	0.48	0.09
	Refugee population	0.044	0.230	0.340	0.25	0.005	0.08	0.50	0.23	0.40	1.000	0.70	0.030	0.44	0	0.18	0.18	0.022	0.088	0.030
	Political stability	0.066	0.40	0.056	0.058	0.380	1.0	0.38	1.60	0.270	1.6	0.084	0.720	0.20	0.088	1.70	1.40	10.110	0.22	0.088
	Adolescent fertility rate (births per 1,000 women ages 15-19)	1.029112	0.060309	0.045231	220.180	36.066110	110.390	140.160	340.390	390.250	120.240	220.240	110.380	0.050321	30.140	120.222	0.027070	30.380	0.066208	50.04400
	Age dependency ratio (% of working-age population)	0.72	1.149	1.61	110.250	0.78	1.10	1.20	0.81	1.30	2.0	0.84	0.029	2.0	3.0	2.4	0.1	0.3	0.05	0.70
	Age dependency ratio, old (% of working-age population)	0.13	0.45	1.03	0.46	0.40	0.48	0.53	0.30	0.30	0.10	0.08	0.04	0.07	0.07	0.04	0.07	0.04	0.07	0.04
	Age dependency ratio, young (% of working-age population)	0.66	1.60	3.8	1.0	2.0	2.7	0.80	5.0	1.0	4.7	3.3	0.60	1.8	2.0	3.0	0.30	0.30	0.30	0.30
	Agriculture, forestry, and fishing, value added (% of GDP)	0.039	1.81	0.40	1.0	0.2	0.040	0.4	0.10	0.40	0.6	0.1	0.04	0.03	0.1	0.04	0.03	0.1	0.04	0.03
	Armed forces personnel (% of total labor force)	0.06	0.25	0.40	270.28	1.0	0.30	0.30	0.9	1.0	1.0	30.070	0.28	0.30	0.4	0.20	0.41	1.4	1.4	0.4
	Birth rate, crude (per 1,000 people)	0.045078	0.48	0.81	0.84	3	1.0	0.30	1.0	0.39	0.70	0.28	0.30	0.50	0.30	0.28	0.70	0.28	0.30	0.50
	Death rate, crude (per 1,000 people)	0.23	0.18	0.50	0.03	0.34	0.38	1.06	0.30	0.30	0.30	0.10	0.20	0.03	0.10	0.03	0.03	0.10	0.03	0.10
	Employment in agriculture (% of total employment) (modeled ILO estimate)	0.220	1.0	0.038	12.0	0.098	1.08	1.0	0.140	0.48	0.28	0.43	0.27	0.080	0.6	0.30	0.44	0.28	0.43	0.27
	Employment in industry (% of total employment) (modeled ILO estimate)	0.18	0.05	0.40	0.40	1.0	0.05	0.1	0.6	0.2	0.10	0.066	0.2	0.10	0.20	0.080	0.44	0.09	0.14	0.20
	Employment in services (% of total employment) (modeled ILO estimate)	0.38	0.010	0.30	0.60	0.44	1.0	0.30	0.40	0.6	1.0	1.320	1.0	0.98	1.8	2.40	1.0	2.40	2.5	0.44
	Fertility rate, total (births per woman)	0.069	0.390	1.0	0.60	0.60	0.70	0.30	2.0	1.0	0.32	1.0	0.20	1.0	0.40	0.50	0.30	0.50	0.40	0.60
	GDP (current US\$)	0.110	250.360	150.100	0.070	2.90	390.250	270.120	2.2	1.0	0.68	1.0	0.018	0.018	0.070	2.80	0.018	0.018	0.070	2.80
	GDP growth (annual %)	0.18	0.020	0.090	0.230	2.20	2.50	2.8	0.32	0.44	1.0	0.09	1.0	0.1	0.1	0.290	0.40	1.270	1.0	0.290
	GINI index (World Bank estimate)	0.32	0.04	1.00	0.30	1.0	0.30	0.14	0.27	0.68	1.80	0.40	1.0	1.0	0.4	0.30	0.50	0.80	0.20	0.68
	Government expenditure on education, total (% of government expenditure)	0.14	0.020	0.35	0.390	0.70	0.64	0.50	0.28	0.88	0.74	0.40	0.18	0.20	0.40	0.10	0.05	0.10	0.05	0.10
	Income share held by fourth 20%	0.180	0.26	0.56	0.340	1.8	0.40	1.8	0.56	1.20	1.0	0.58	1.0	0.30	0.30	0.30	1.0	0.20	0.56	0.340
	Income share held by highest 20%	0.36	0.110	0.190	0.280	1.30	0.390	0.28	1.0	1.0	0.30	1.0	0.20	0.30	0.30	0.30	1.0	0.20	0.30	0.30
	Income share held by lowest 20%	0.35	1.10	1.8	0.															
	Income share held by second 20%	0.33	1.8	0.89	0.250	1.4														

imputing

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